DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final

2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	Eaker Air Force Base
Facility Address:	P.O. Box 9400, Gosnell, AR 72319
Facility EPA ID #:	AR8751924473

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

— If no - re-evaluate existing data, or

— if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the

Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

___ **X** If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

___ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

___ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Please refer to attached Tables 1 and 2 for constituents of potential concern and the Eaker Air Force Base Risk Assessment Report for cleanup levels.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

___ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

___ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

This determination was originally listed as incomplete on 09-10-01, based upon the fact that regular long-term groundwater monitoring programs had not been implemented over a long enough period of time to provide adequate documentation of stabilization. The *Remedial Action Decision Document, Corrective Measures Study* and *Corrective Measures Implementation* provided appropriate mechanisms for reasonable assurance of stabilization that could have enabled a yes determination at that time, although physical data was lacking for validating the determination. Eaker has since submitted *Annual Long Term Monitoring Status Reports* September 2001, December 2002, and December 2003 that provide adequate documentation of stabilization. EPA has since clarified through training that stabilization can be determined at the time that appropriate mechanisms are in place in the remediation process and need not be based upon a particular interval of time in the monitoring programs.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

If yes - continue after identifying potentially affected surface water bodies.

___

X If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

___

If unknown - skip to #8 and enter "IN" status code.

___

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

___ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>key</u> contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

___ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

___ If unknown - enter "IN" status code in #8.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be **"currently acceptable"** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

___ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation

demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

If no - enter "NO" status code in #8.

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If unknown - enter "IN" status code in #8.

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Eaker Air Force Base facility, EPA ID # AR8571924473, located at Blytheville, AR. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by	(signature)	David S. Hartley	Date	01/16/04
	(print)	David S. Hartley		
	(title)	Geologist, P.G.		

Supervisor	(signature)		Date	01/16/04
	(print)	Jim Rigg		
	(title)	Geologist Supervisor		
	(EPA Region or State)			

Locations where References may be found:

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Locations where References may be found:

Locations where References may be found:
ADEQ Records Section 8001 National Drive Little Rock, AR 72219-8913

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TABLE 1 CHEMICALS OF POTENTIAL CONCERN
RCRA Corrective Measures Study
EAKER AIR FORCE BASE

1,1,1-Trichloroethane	Benzo(k)fluoranthene	Lead	Toluene
1,1,2,2-Tetrachloroethane	Beryllium	m-Xylene	Trichloroethene
1,1-Dichloroethane	beta-BHC	Manganese	Vanadium
1,1-Dichloroethene	Bis(2-ethylhexyl)phthalate	MCPA	Vinyl chloride
1,2,4-Trimethylbenzene	Cadmium	MCPP	Xylene (total)
1,2-Dichloroethene	Chlordane	Mercury	Zinc
1,2-Dichloroethene (total)	Chlorobenzene	Methyl parathion	
1,3,5-Trimethylbenzene	Chloroform	Methylene chloride	
2,4-D	Chromium III	Molybdenum	
2,4-Dimethylphenol	Chromium VI	N-Nitrosodiphenylamine	
2-Methyl Naphthalene	Chrysene	Naphthalene	
4,4'-DDD	cis-1,2-Dichloroethene	Nickel	
4,4'-DDE	Copper	Nitrate	
4,4'-DDT	delta-BHC	Nitrobenzene	
4-Methyl-2-pentanone	Di-n-octyl phthalate	o-Xylene	
Acetone	Dibenz(a,h)anthracene	p-Chloroaniline	
alpha-BHC	Dieldrin	p-Cresol	
Aluminum	Dimethoate	p-Dichlorobenzene	
Anthracene	Disulfoton	PCB-1260	
Antimony	Endrin	Pentachlorophenol	
Arsenic	Ethylbenzene	Phenanthrene	
Barium	Fluoranthene	Phorate	
Benzene	Fluoride	Pyrene	
Benzo(a)anthracene	gamma-BHC	Selenium	
Benzo(a)pyrene	Heptachlor epoxide	Styrene	
Benzo(b)fluoranthene	Indeno(1,2,3-cd)pyrene	Tetrachloroethene	
Benzo(ghi)perylene	Iron	Thallium	

TABLE 2 SWMU AND AOC STATUS CORRECTIVE MEASURES STUDY
EAKER AIR FORCE BASE

Unit	Site Name	Recommendation
Sites Recommended for No Further Action in the RFA		
SWMU No.10	Hospital Incinerator	NFA
SWMU No.11	Satellite Waste Accumulation Points	NFA
SWMU No.15	Electronic Environmental Room	NFA
SWMU No.16	Aerospace Ground Equipment Shop	NFA
Other Sites Removed from Further Evaluation		
SWMU No.7	Defense Reutilization Marketing Office Storage Facility	RCRA Closure Plan Submitted and is under review by ADEQ & EPA
SWMU No.8	Explosive Ordnance Disposal Area	RCRA Closure Plan Submitted and is under review by ADEQ & EPA
SWMU No.19	Silver Recovery Units	Recovery Units Removed
AOC No. 6	Spill Site No. 3	Decision Document Submitted
AOC No. 8	Wastewater Treatment Plant Outfall	Covered Under NPDES Permit
Sites Recommended for No Further Action in the RFI		
SWMU No.12	Auto Hobby Shop	NFA
SWMU No.18	Wastewater Treatment Plant	NFA
AOC No. 7	Deicer Solution Impoundments	NFA
AOC No. 9	Sanitary Sewer System	NFA
Sites Requiring CMS Action		
SWMU No. 1	Fire Protection Training Area	CMS Evaluation
SWMU No. 2	Underground Waste Oil Tanks	CMS Evaluation
SWMU No. 3	Landfill No. 1	CMS Evaluation
SWMU No. 4	Landfill No. 2	CMS Evaluation
SWMU No. 5	Landfill No. 3	CMS Evaluation
SWMU No. 6	Landfill No. 4	CMS Evaluation
SWMU No. 9	Bulk Fuel Storage Tank Farm	CMS Evaluation
SWMU No.13	Roads and Grounds Maintenance Facility	CMS Evaluation
SWMU No.14	General Vehicle Maintenance Facility	CMS Evaluation
SWMU No.17	Oil/Water Separators	CMS Evaluation
SWMU No.20	Corrosion Control Facility	CMS Evaluation
SWMU No.21	Base Exchange Shoppette	CMS Evaluation
AOC No. 1	Underground Storage Tanks	CMS Evaluation
AOC No. 2	Flightline Hydrocarbon Transfer System (JP-4 Piping)	CMS Evaluation
AOC No. 3	Pesticide Storage and Mixing Area	CMS Evaluation
AOC No. 4	Spill Site No. 1	CMS Evaluation
AOC No. 5	Spill Site No. 2	CMS Evaluation